DOCUMENT RESUME

ED 176 855 PS 010 728

AUTHOR Connolly, Jennifer; Doyle, Anna-Beth
TITLE Social Competence in the Preschool: A Multivariate View.
PUB DATE Mar 79
GRANT DGES-EQ-1099
NOTE 31p.; Paper presented at the Biennial Meeting of the Society for Research in Child Development (San Francisco, California, March 15-18, 1979)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Day Care Programs; Early Childhood Education; Factor Analysis; *Interpersonal Competence; Measurement Techniques; Peer Relationship; Play; *Preschool Children; *Social Behavior; *Social Relations; *Statistical Analysis; Teacher Attitudes
IDENTIFIERS *Social Competence

ABSTRACT

This study was designed to provide additional understanding of the construct of social competence by using multiple assessments, including both behavioral and inferential techniques. Indices of qualitative social behaviors and of quantitative interaction dimensions were collected on 66 preschoolers during free play. Scores on the Kohn and Rosman Social Competence Scale, on a picture sociometric test and on a teacher ranking of peer popularity were also obtained. Age and IQ estimates were additionally recorded. Multivariate techniques, including factor analysis, multiple regression, and canonical correlation, were used to investigate the overlap among behavioral and inferential data sets. Results indicated that the greatest degree of overlap occurred between the teacher-derived social competence measures, developmental maturity, and the behavioral factors defined by the frequent use of successful social behaviors such as attention-eliciting, question-asking, directing a peer's activities and competing for toys. Peer popularity and the quantitative interaction factors were less clearly convergent with these measures. (Author/MP)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED176855

U S DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

Social Competence in Preschoolers:

A Multivariate View

Jennifer Connolly, Anna-Beth Doyle

and

David Andres

Concordia University

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Anna-Beth Doyle

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

PS 010728

Address for reprints: Department of Psychology, Concordia University
1550 deMaisonneuve Blvd. West, Suite 600,
Montreal, Quebec, Canada H3G 1M8

Portions of this paper were presented at the biennial meeting of the Society for Research in Child Development, San Francisco, 1979. The work reported here was partially funded by grant DGES EQ-1099. The authors wish to thank the directors and teachers of the participating schools for their cooperation in this project. We also thank Pamela Rappard, Linda Chaim and the many others who acted as observers and testers.

Running Head: Social Competence

Abstract

An integration of current research on social competence was attempted by using multiple assessments, including both behavioral and inferential techniques. Indices of qualitative social behaviors and of quantitative interaction dimensions were collected on sixty-six preschoolers during free-play. Scores on the Kohn & Rosman Social Competence Scale, on the picture sociometric test and on a teacher ranking of peer popularity were also obtained. Age and IQ estimates were additionally recorded. Multivariate techniques, including factor analysis, multiple regression, and canonical correlation were used to investigate the overlap among behavioral and inferential data sets. Results indicated that the greatest degree of overlap occurred between the teacher-derived social competence measures, developmental maturity, and the behavioral factors defined by the frequent use of successful social behaviors such as attention-eliciting, question-asking, directing a peer's activities and competing for toys. Peer popularity and the quantitative interaction factors were less clearly convergent with these measures. Further investigation of these qualitative behaviors is warranted. Additionally, their preferential use, in conjunction with teacher judgements, is strongly suggested.

Social Competence in Preschoolers:
A Multivariate View

Many developmental psychologists are attempting to define the dimensions and correlates of peer group social competence in young children (Anderson & Messick, 1972; O'Malley, 1976). This current interest has been stimulated by several factors. First, contrary to earlier opinion, young children have been shown to possess considerable skill in their peer interactions (Garvey & Hogan, 1974; Mueller, 1973). Secondly, competency in peer social relations is now being recognized as a major vehicle by which children may acquire important social skills (Hartup, 1976; Lewis, Young, Brooks, & Michaelson, 1975). Finally, a number of studies demonstrate a relationship between early social competence and later academic, emotional, and psychosocial achievements (Bronson, 1966; Kohn, 1977; Roff, Sells & Golden, 1972).

Despite general acknowledgement of the importance of peer group social competence in a child's early development, there has been relatively little agreement in the literature regarding its assessment and components. Two major orientations are prevalent. On the one hand, social competence is often identified by means of inferential judgement procedures, using either teachers (Jennings, 1975; Kohn, 1977) or peers (Gottman, 1977; Gottman, Gonso & Rasmusen, 1975) as judges. Teacher judgements are collected either by means of

standardized rating scales (Kohn & Rosman, 1972; Levine, Elzey & Lewis, 1969) or more subjective global rating procedures (Chandler, Greenspan & Barenboim, 1974). Peer judgements are typically collected by means of sociometric tests. Alternatively, social competence has been identified by observation of social behaviours. These observations typically focus on quantitative features of the social process, such as the rate or frequency of social interaction (O'Connor, 1969, 1972). However, the importance of observing qualitative aspects of the behaviour has been noted by certain investigators (Jennings, 1975; Mueller & Brenner, 1977). One attempt to systematically observe qualitative features of the social interaction process has been developed by White & Watts (1973). In their approach, the occurance of specific social events is recorded, as well as the successfulness and positive vs. negative tone of the bid.

In essence, four types of assessment measures are commonly found in the literature; sociometric status, teacher ratings, quantitative behavioural observations and qualitative behavioural observations. One might thus postulate that the convergence of these measures would provide an adequate definition of social competence and one might therefore expect that the competent preschooler would be popular with his peers, would be rated highly by his teachers, would interact frequently with other children and would demonstrate qualitatively superior social behaviours. While, appealing, this convergence has not been investigated empirically

and the assumption of equivalence among assessment measures remains purely speculative.

Two research paradigms are in general usage in the analysis of the components of social competence. First, using a correlational design, subjects are classified in terms of their scores on one of the competence measures. Their status on a variety of theoretically relevant dimensions such as academic achievement (Kohn, 1977), positive social behaviours (Hartup, Glazer & Charlesworth, 1967), security of attachment (lieberman, 1977) social cognition (Gottman et al, 1975; Jennings, 1975; Rubin, 1972), age (Mueller, 1977) and peer experience (Becker, 1977; Lewis et al, 1975; Young & Lewis, 1979) is then analyzed. In general, significant relationships are found between these variables and the competence measure employed in the study. Secondly, a pretest-posttest design has been used in which children identified as low in competence according to one of the measures described earlier, have taken part in treatment programs aimed at enhancing their social skills (Gottman, 1977; Jakibchuck & Smeriglio, 1977; Oden & Asher, 1977; O'Connor, 1969; 1972). Both peer popularity and frequency of interaction have been shown to increase as a result of these interventions.

From this growing body of research an understanding of the dimension of social competence would be desirable. However, the task of summarizing is rendered difficult by the failure to establish a pattern of correlates that are consistent across a number of

studies. Correlates established as significant relative to one competence measure are not uniformly so related in other studies. For example, Deutsch (1974) reports a significant correlation between rate of social interaction and social cognition skills while Jennings (1975) did not find such a relationship. On the other hand, Jennings (1975) and Rubin (1972) both found that peer popularity and cognition skills were significantly correlated while Deutsch (1974) did not. Further confusion is added by the fact that the competence measures themselves are not clearly intercorrelated. Early studies, for example, investigating peer popularity reported that it was significantly correlated with the amount of positive social interaction shown by the child (Hartup, Glazer & Charlesworth, 1967; Marshall & McCandless, 1957). However, two more recent studies have not replicated this relationship (Gottman, 1977; Jennings, 1975). Furthermore, social competence as reflected in teacher ratings or free-play observations of qualitatively superior social behaviour have been reported to be unrelated to social competence as measured by high rates of behavioural interaction (Jennings, 1975; Wright, Note 1). These glaring contradictions continue to exist in the literature because no study has comprehensively examined the interrelationships among the social competence measures currently in use. Such a study is necessary in order to provide an empirical basis for the integration and further conceptualization of this important construct. The research to be reported in this study

sought to provide an initial step in this direction. Multiple measures of social competence, behavioural (observations of quantitative and qualitative social interaction dimenions) and inferential, (teacher and peer ratings), were collected simultaneously for the same group of preschoolers. The interrelationships among these measures were then examined so as to provide an initial synthesis of current research efforts in social competence.

Method

Subjects. Sixty-six children enrolled full-time in four Montreal day-care centres took part in this study. They ranged in age from 31 to 64 months (M = 52.3) and were from predominantly middle- and lower-middle-class homes (Blishen, 1967).

Measures and Procedure. Each child in the study was assessed on five measures of social competence; three inferential and two behavioural. In addition, two subtests of the WPPSI (Similarities and Picture Completion) were administered to obtain an index of intellectual maturity.

Inferential Measures - 1. Each child's peer popularity was measured in two ways. First, a sociometric test was administered. Individual 3" X 4" black and white photographs of each child in a class were mounted on a board in random order. The children, tested individually, were first asked to name each child on the board and to find their own picture. The examiner then asked the child to imagine that there was a new game in the school that just two

children could play. The child was then asked to select a playmate for the game. Following the selection of a first playmate the picture of the chosen child was removed from the board and a second and third choice were similarly elicited. Each subject's score was calculated as the total number of nominations received from the other children. Since the classrooms varied greatly in size (8 to 35), each child's score was adjusted using Willingham's (1959, a, b) correction for nominating group size, which takes into account both the size of the nominating group and the internal consistency of the scores in that group. Test-retest reliability was obtained by re-administering the test in two of the four classrooms approximately two weeks later. Reliability coefficients averaged .75 in the two groups.

Secondly, each classroom teacher was asked to rank order the children in the classroom in terms of their popularity with peers as a playmate. Since difficulty in obtaining adequate reliability with the sociometric measure has been reported, the teacher ranking technique was included as an additional exploratory measure which appears to provide equivalent, and highly reliable data (Greenwood, Walker, Todd & Hops, Note 2).

2. The classroom teacher's rating of each subject's social competence was obtained using the Kohn & Rosman Social Competence Scale (Kohn & Rosman, 1972). This is a 73-item questionnaire in which a child's performance on each item is rated using a 7-point

scale. The items are summed to yield two factors, Interest-Participation and Cooperation-Compliance. The former reflects involvement and interest in classroom activities and with peers. The latter reflects conformity to the rules, regulations and routines of the classroom.

The reliability of the Teacher Popularity ranking and of the Kohn & Rosman Scale were obtained by requesting the assistant teacher in two of the classrooms to independently complete the forms. Reliability of the teacher rankings averaged .94. The Kohn & Rosman Interest-Participation factor averaged .91, and the Kohn & Rosman Cooperation-Compliance factors averaged .68.

Behavioural Observations Measures - During the free play period, two types of behavioural observations were collected over a 3-month period by five undergraduate observers.

1. Qualitative Social Behaviours. An adapted version of the Social Behaviours Checklist (White & Watts, 1973) was used to record the occurance of nine discrete peer-oriented social behaviours. These behaviours included attention-seeking, resource-seeking, leading a peer, competing with a peer, following a peer's verbal or non-verbal direction, imitating a peer, refusing to follow a peer directive, and expressing affection or hostility to a peer. The first four categories were further scored in terms of their effectiveness (successful vs. unsuccessful) and in terms of their affective tone (positive vs. negative). Five separate 10-minute samples per child were collected over the 3-month period. Scores

for each child in each category were the sums of frequencies across the five time-periods.

2. Quantitative Social Interaction. Concurrent with the Social Behaviours Checklist, an independent observer employed a time-sampling technique to assess each child's rate of social interaction with peers. Frequency of interaction, duration of interaction, the mode of entering an interaction (initiating or responsive) and the use of language in interaction (verbal, non-verbal) were recorded using a 10-second time interval. Two ten-minute samples were collected for each child, and a frequency, summed over the 20 minutes, was calculated for each category.

Reliability on the two behavioural measures was assessed by means of independent observations collected concurrently with another observer and randomly distributed throughout the period of data collection. Percent agreement averaged 84.3% across categories for the Social Behaviours Checklist and 89% across categories for the Social Interaction Time-Sampling.

Method of Analysis. The analytic strategy used to examine these data was based on a procedure outlined by Skinner (1978) for the investigation of relationships between multiple data sets. In this approach, clusters of variables are organized into separate data sets which are individually summarized by means of factor analyses. Orthogonal factors derived from each analysis

are then adjoined in a supermatrix. This supermatrix can itself be analysed by means of multiple regression analyses and by means of a canonical correlation. From the regression analyses, one derives the linear combination of variables in one data set which maximally correlates with each of the variables in the second set. The canonical correlation provides the linear combinations of variables in each data set which maximizes the correlation between the two data sets. Between-set relationships derived in these analyses have the advantage of being subject to tests of statistical significance.

For the purpose of the present analysis, the behavioural variables were treated as one data set and the inferential measures were treated as the second data set. Age and intellectual maturity (WPPSI raw score) were also included in the analysis of the second data set. Following the strategy outlined above, the two data sets were individually submitted to a factor analysis. The between-set relationships of the factors derived from the analysis of each data set were then examined in two ways. A first analysis considered the relationship between the set of behavioral factors and each of the inferential factors separately. Specifically, multiple regression equations were computed for the factors derived from the behavioural data set and each of the factors derived from the inferential data set. A second analysis considered the relationship between the factors of both sets considered simultaneously. For this analysis,

a canonical correlation was computed between the factors derived from the behavioural data set and the factors derived from the inferential dataset.

Results

Factor Analysis - Behavioural Variables. The intercorrelation matrix based on the twenty-four behavioural variables was computed and a varimax rotation of the principal factor solution was calculated. Using the Scree-test (Gorsuch, 1974), four factors, accounting for 46% of the variance were retained. These are summarized in Table 1.

Insert Table 1 about here

The first factor loaded on variables reflecting extensive positive interaction with peers, involving both leading and responsiveness on the part of the child. This factor, with heaviest loadings on the quantitative interaction variables derived from the time-sampling, appears to be primarily a measure of frequency of positive social interaction.

In contrast to the first factor, the three subsequent factors loaded on qualitative social behaviour variables. Factor II is defined by variables reflecting successful verbal control over a peer's behaviour through the use of attention-attracting, resource-seeking, and directive-giving. The third factor is defined by variables reflecting unsuccessful attempts to control a peer's

behaviour as well as by refusal to follow the lead of a peer. The last factor is defined by variables reflecting an assertive attitude towards others, using both positive and negative assertive actions.

Factor Analysis - Inferential Variables. - The intercorrelation matrix of the four inferential measures, peer popularity, teacher popularity ranking, Kohn & Rosman Factor I and Kohn & Rosman Factor II, and the two developmental measures, age, and intellectual maturity, was computed. The principal factors solution for the matrix was calculated. Again using the Scree test (Gorusch, 1974) four factors, accounting for 89% of the variance, were retained and rotated using varimax criteria. These results are shown in Table 2.

Insert Table 2 about here

The first factor, with loadings on age and WPPSI scores, appears to reflect developmental maturity. The second factor loads primarily on the Cooperation-Compliance factor of the Kohn & Rosman Scale. The third factor loads on the two teacher-derived estimates of peer social skill: the teacher popularity ranking and the Interest-Participation factor of the Kohn & Rosman Scale. The last factor loads on the peer-popularity measure.

Multiple Regression Analysis. A series of multiple regression analyses were computed in which the four behavioural factors were regressed on each of the four inferential factors. The results are summarized in Table 3.

Insert Table 3 about here

Examination of the obtained regression equations and their corresponding multiple correlations reveals that a subject's status on the factors Developmental Maturity ($R = .50$, $p < .001$) and Social Competence-Teacher ($R = .47$, $p < .001$) can be significantly predicted from the behavioural factors. In addition, a trend was obtained for the inferential factor, Popularity-Peers ($R = .24$, $p < .06$). However, the Beta weights contributing significant information to the three regression equations are different. Developmental Maturity is related to Behavioural Factor II (Successful Verbal Control of Peers) and Behavioural Factor IV (Assertion with Peers). Social Competence-Teacher is related to Behavioural Factor I (Positive Interaction with Peers), Behavioural Factor II (Successful Verbal Control of Peers) and Behavioural Factor III (Unsuccessful Control of Peers). Popularity-Peers is related only to Behavioural Factor IV (Assertion with Peers).

Canonical Correlation Analysis. A canonical correlation was computed for the supermatrix based on the within-set and between-

set correlations of the four behavioural factors and the four inferential factors. These results are shown in Table 4.

Insert Table 4 about here

Three coefficients of canonical correlation were extracted, of which only the first was statistically significant ($R^2 = .64$, $p < .001$). An examination of this first pair of canonical variates suggests that four out of the eight factors in the analysis are significantly overlapping. Two of the factors from the behavioural factor set show coefficients greater than .50; Behavioural factor II (Positive Successful Peer Control) and Behavioural Factor IV (Assertion with Peers). From the inferential measures set, two factors show coefficients greater than .50; Developmental Maturity and Social Competence-Teacher. In addition, the inferential factor, Popularity-Peer, with a coefficient of .37, appears to contribute to the overall regression equation, although with lesser importance than the other factors.

Discussion

The present study was designed to increase our understanding of the social competence construct by examining the interrelationships and overlap among behavioural and inferential assessment procedures. The obtained results may be examined in terms of the within-set analyses and in terms of the between-set analyses.

The within-set factor analysis of the behavioural variables collected during free-play suggests that peer group social activity cannot be adequately accounted for by a single dimension. Rather, the analysis suggests that such activity can be meaningfully separated into dimensions tapping both quantitative and qualitative features. A factor defined primarily by variables measuring rate and duration of peer interaction emerged as a first quantitative dimension. Three independent factors characterized by loadings on variables measuring qualitative aspects of the interaction process also emerged. The ability to formulate a successful social bid, a child's salience or assertiveness over other children in the classroom, and the capacity to use language in formulating a social gesture, all appear as important characteristics of social competence. These results support previous suggestions that quantitative and qualitative measures of interaction are not synonymous (Gottman, 1977; Jennings, 1975). It would appear rather, that both dimensions are important in adequately describing social activity.

The within-set factor analysis of the inferential measures suggests that, as with the behavioural measures, a single dimension is not sufficient. A developmental maturity factor emerged first, and accounted for the largest percentage of the variance. Three additional factors, with relatively unique loadings on the different inferential measures were also extracted. Teacher-assessed social

competence, peer-assessed social competence, and teacher-assessments of cooperation-compliance, emerged as independent factors.

The analysis of the between-set relationships suggests that the social competence measures overlap only in rather complex ways. When the inferential factors were considered independently, each related to a different configuration of behavioural factors. Developmental Maturity related to qualitative features specifying successful-verbal control over and assertiveness with peers. More mature children appeared to be more successful in leading a peer, in attracting his attention, in asking questions, and in competing for toys. On the other hand, social competence as assessed by teacher's rankings and ratings of the children, was related to both qualitative and quantitative dimenions. Highly rated children were socially active, and made social control bids, both successful and unsuccessful. Finally, popularity as measured by the peer sociometric test, was related only marginally ($p < .06$) to the behavioural factors. In these classrooms, highly popular children tended to be those who were behaviourally salient, although not necessarily in a positive and successful manner. In general, when the inferential factors are considered separately, maturational changes relate to qualitative dimensions of the social process, whereas teacher's assessments relate to changes in the frequency and duration of the social interaction as well as to qualitative changes. However, in both cases, only approximately

25% of the total variance is accounted for by either regression equation.

When analysed by means of a canonical correlation, developmental maturity, teacher assessed social competence, and to a lesser extent, peer popularity, load on the same pair of canonical variates. In this case, where all factors are considered simultaneously, it seems that children who are more cognitively and developmentally mature, and who are assessed highly on social competence measures both by teachers and by peers, are characterized behaviourally by the qualitative features of social bid successfulness, peer social control and the social use of language. These dimensions, rather than a high rate of social interaction would appear to be particularly important for the behavioural definition of social competence. It is of interest to note that in this analysis, a child's teacher is a more potent discriminator of social competence than are his peers. These results are somewhat at variance with findings documenting the utility of peer popularity in predicting later social adjustment of elementary school children (eg. Roff, Sells & Golden 1972). It may well be however, that with a younger group of children, teachers provide more accurate assessments. Consequently, the increased use of teacher judgements in social competence research with preschoolers would be desirable.

It is of further interest to note that when all factors are considered together in the same analyses, the percentage of total variance accounted for is substantially increased over the results of the independent analyses (41% vs. 25% and 22% respectively). This

suggests that adequate assessment of a child's social competence involves understanding his developmental status as well as understanding his social status. Use of only one inferential measure results in a loss of information. However, the subjects in our study varied greatly in age. In a sample of children more homogeneous with respect to developmental status, teacher and peer assessments of competence would possibly be most useful in discriminating among different levels of competence.

In summary, the results of this research have many implications for further study of social competence in children. The greatest overlap was found between behavioural measures defining qualitative dimensions of social interaction and inferential measures defining developmental status and teacher-or-peer-perceived social competence. Further elaboration of the growth of these social behaviours is clearly needed. Furthermore, since qualitative and quantitative behavioural measures did not systematically overlap, social competence should carefully distinguish between these two types of measurement. With respect to the inferential measures, it is clear that they also do not completely overlap and do not all tap the same dimensions in the preschool classroom. The simultaneous usage of several of these measures greatly enhances their discriminatory power and argues further for the use of multiple measurement procedures in future research.

Reference Notes

1. Wright, M. Assessing the social competence of preschoolers aged three to six years. Paper presented at the annual meetings of the Canadian Psychological Association, Vancouver, 1977.

2. Greenwood, C.R., Walker, H.M., Todd, N.M., & Hops, H. The utility of the peer nomination sociometric as a predictive variables in preschool social withdrawal. Report No. 30, CORBEH, University of Oregon, 1978.

References

Anderson, S. & Messick, S. Social competency in young children.. Developmental Psychology, 1974, 10, 282-293.

Becker, J.M.T. A learning analysis of the development of peer-oriented behaviour in nine-month-old infants. Developmental Psychology, 1977, 13, 481-491.

Blishen, B.R. A socio-economic index for occupations in Canada. Canadian Review of Sociology and Anthropology, 1967, 4, 41-53.

Bronson, W.C. Control orientations: A study of behaviour organization from childhood to adolescence. Child Development, 1966, 37, 125-155.

Chandler, M.J., Greenspan, S. & Barenboin, C. Assessment and training of role-taking and referential communication skills in institutionalized emotionally disturbed children. Developmental Psychology, 1974, 10(4), 546-553.

Deutsch, F. Observational and sociometric measures of peer popularity and their relationship to egocentric communication in female preschoolers. Developmental Psychology, 1974, 10, 745-747.

Garvey, C. & Hogan, R. Social speech and social interaction: egocentrism revisted. Child Development, 1973, 44, 562-568.

Gorsuch, R.L. Factor Analysis. Saunders, Toronto: 1974.

Gottman, J. Toward a definition of social isolation in children. Child Development, 1977, 48, 513-517.

Gottman, J., Gonso, J. & Rasmusen, B. Social interaction, social competence and friendship in children. Child Development, 1975, 46, 709-718.

Hartup, W.W. Peer interaction and the behavioural development of the individual child. In Schapler & Reichler (Eds.) Psychopathology and Child Development, New York:Plenum Pub. Co., 1976.

Hartup, W.W., Glazer, J.A. & Charlesworth, R. Peer reinforcement and sociometric status. Child Development, 1967, 38, 1017-1024.

Jakibchuk, Z. & Smeriglio, V.L. The influence of symbolic modeling on the social behaviour of preschool children with low levels of social responsiveness. Child Development, 1976, 47, 838-841.

Jennings, K.D. People vs. object orientation, social behaviour, and intellectual abilities in preschool children. Developmental Psychology, 1975 (July), Vol. 11(4), 511-519.

Kohn, M. Social competence, symptoms and underachievement in childhood: A longitudinal perspective. Washington: Wiley, 1977.

Kohn, M. & Rosman, B.L. A social competence scale and symptom checklist for the preschool child: Factor dimensions, their cross-instrument generality, and longitudinal persistence. Developmental Psychology, 1972, 6, 430-444.

Levine, S., Elzey, F., & Lewis, M. The California Preschool Social Competency Scale. Consulting Psychologists Press, 1969.

Lewis, M., Young, G., Brooks, J., & Michalson, L. The beginnings of friendship. In Lewis & Rosenblum (Eds.) Friendship and Peer Relations, N.Y.:Wiley, 1975.

Lieberman, A.F. Preschoolers' competence with a peer: Influence of attachment and social experience. Child Development, 1977, 48, 1277-1287.

Marshall, H.R. & McCandless. A study in prediction of social behaviour of preschool children. Child Development, 1957, 28, 149-

Mueller, E. The maintenance of verbal exchanges between young children. Child Development, 1972, 43, 930-938.

Mueller, E., & Brenner, J. The origins of social skills and interaction among play group toddlers. Child Development, 1977, 48, 854-861.

O'Connor, R.D. Modification of social withdrawal through symbolic modeling. Journal of Applied Behaviour Analysis, 1969, 2, 15-22.

O'Connor, R.D. Relative efficacy of modeling, shaping, and the combined procedures for modification of social withdrawal. Journal of Abnormal Psychology, 1972, 79, 327-334.

Oden, S., & Asher, S. Coaching children in social skills for friendship-making. Child Development, 1977, 48(2), 495-506.

O'Malley, J.M. Research perspective on social competence. Merrill-Palmer Quarterly, 1977, Vol. 23, No. 1, 29-44.

Roff, M., Sells, S.B. & Golden, M.M. Social adjustment and personality development in children. Minneapolis: U. of Minn. Press, 1972.

Rubin, K.H. Relationship between egocentric communication and popularity among peers. Developmental Psychology, 1972, 7, 364.

Skinner, H.A. The art of exploring predictor-criterion relationships. Psychological Bulletin, 1978, 85, 327-337.

Willingham, W.W. On deriving the standard scores, for peer nominations with subgroups of unequal size. Psychological Reports, 1959, 5, 397-403(b).

Willingham, W.W. Estimating the internal consistency of mutual peer nominations. Psychological Reports, 1959, 5, 163-167(a).

White, B.L. & Watts, J.C. Experience and Environment, Vol. 1. Englewood Cliffs: Prentice-Hall, 1973.

Young, G. & Lewis, M. Effects of familiarity and maternal attention on infant peer relations. Merrill-Palmer Quarterly, 1979, 25, 105-119.

TABLE 1

FACTOR ANALYSIS[1] OF FREE-PLAY SOCIAL BEHAVIOUR VARIABLES

VARIABLE	FACTOR I (Positive Interaction with peers)	FACTOR II (Successful Verbal Control of Peers)	FACTOR III (Unsuccessful Control of Peers)	FACTOR IV (Assertion with Peers)
Gains peer's attention-successful		.43		
Uses peer as resource-successful		.49		
Leads peer-positive-successful	.44	.46		.45
Leads peer-negative-successful				.46
Follows peer when directed	.67			
Follows peer-no direction	.67			
Shows affection to peer	.72			
Shows hostility to peer				.41
Gains peer's attention-unsuccessful			.68	
Uses peer as resource-unsuccessful			.59	
Leads peer-positive-unsuccessful			.54	
Refuses to follow peer's directive			.65	
Competes for equipment-successful			.41	.53
Competes for equipment-unsuccessful			.55	
Rate of peer interaction	.84			
Duration of peer interaction	.71			
Verbal initiation		.81		
Nonverbal response		-.86		
Nonverbal initiation				-.59
Verbal response				.46

1 Principal Components Analysis with Varimax Rotation

TABLE 2

FACTOR ANALYSIS OF INFERENTIAL SOCIAL COMPETENCE VARIABLES[1]

VARIABLE	FACTOR I (Developmental Maturity)	FACTOR II (Cooperation-Compliance)	FACTOR III (Social Competence-Teachers)	FACTOR IV (Popularity-Peers)
Age	.89			
WPPSI	.85			
Peer Popularity				.98
Teacher's Peer Popularity Rank			-.90	
Kohn & Rosman Factor I (Interest-Participation)		.42	.76	
Kohn & Rosman Factor II (Cooperation-Compliance)		.96		

[1] Principal Components Analysis with Varimax Rotation

Table 3

Multiple Regression Analyses of the Behavioural Factors with each of the Inferential Factors

(Beta Weights and Multiple Regression Coefficients)

Behavioural Factors (Predictors)				Inferential Factors (Predicted)	R	R^2
Factor I Positive Interaction with Peers	Factor II Successful Verbal Control of Peers	Factor III Unsuccessful Control of Peers	Factor IV Assertion with Peers			
	.28***		.41***	Developmental Maturity	.50***	.25
.27**	.25**	.29***		Social Competence-Teachers	.47***	.22
			.24*	Popularity-Peers	.24*	.06
				Cooperation-Compliance	n.s.	

*** $p < .001$

** $p < .02$

* $p < .06$

Table 4

Canonical Correlation Analysis of the Behavioural Factors Versus the Inferential Factors

	CANONICAL VARIATES			
Behavioural Factors				
Factor I Positive Interaction with Peers	-.24	.55	-.03	.80
Factor II Successful Verbal Control of Peers	-.62	.05	-.74	-.25
Factor III Unsuccessful Control of Peers	-.15	.74	.37	-.54
Factor IV Assertion with Peers	-.73	-.39	.56	.07
Inferential Factors				
Factor I Developmental Maturity	-.74	-.42	.04	-.53
Factor II Social Competence-Teacher	-.56	.81	-.07	.15
Factor III Popularity-Peers	-.37	-.41	-.02	.83
Factor IV Cooperation-Compliance	.01	-.66	-.99	-.04
Eigenvalue	.41	.16	.01	.00
df	16	9	4	1
R	.64***	.40	.12	.01

*** $p < .001$